

## CLAIMS

What is claimed is:

- 5     1. A substrate adapted for mounting a light-emitting diode (LED), the substrate comprising;  
a circuit board having opposed first and second surfaces, the circuit board being constructed  
of an electrically insulating material;  
a pair of electrical lead pads adapted for mounting the LED on the first surface of the circuit  
board;  
10     a heat dissipating structure disposed on the first surface, having:  
an LED thermal pad adapted to abut the LED when the LED is mounted on the pair  
of electrical lead pads, and  
a heat dissipation region extending from and thermally coupled to the LED thermal  
pad; and  
15     a thermally conductive plating disposed directly on the second surface of the circuitboard  
opposite the heat dissipation region.

2. The substrate as recited in claim 1, wherein the heat dissipation region has at least twice the area of the LED thermal pad.

3. The substrate as recited in claim 1, wherein the heat dissipation region includes first and second regions extending from opposite sides of the LED thermal pad.

4. The substrate as recited in claim 1, wherein the heat dissipating structure includes an isolated region that is electrically isolated from the heat dissipation region, the isolated region having a plurality of heat conducting vias that extend through the circuit board and are thermally coupled with the thermally conductive region.

5. The substrate as recited in claim 4, wherein the vias are arranged in spokes that extend outwardly from the LED thermal pad.

6. The substrate as recited in claim 4, wherein the vias are within the heat dissipating structure, but electrically isolated from the heat dissipating structure by a non-electrically-conductive region.

7. The substrate as recited in claim 4, wherein the vias and the heat dissipation region are thermally connected with a conductive bridge layer opposite the circuit board, the conductive bridge layer being electrically isolated from the vias and/or the heat dissipation region by a dielectric layer.

8. The substrate as recited in claim 4, wherein the vias are copper plated through-holes.

9. A lighting assembly comprising;

a substrate, comprising:

a circuit board having opposed first and second surfaces, the circuit board being constructed of an electrically insulating material;

5 a plurality of pairs of electrical lead pads each adapted for mounting a light-emitting diode (LED) on the first surface of the circuit board;

a plurality of heat dissipating structures disposed on the first surface, each having:

an LED thermal pad adapted to abut the LED when the LED is mounted on the pair of electrical lead pads, and

10 a heat dissipation region extending from and thermally coupled to the LED thermal pad;

a thermally conductive plating on the second surface opposite the heat dissipation region;

a plurality of LEDs each connected to one of the pair of electrical lead pads of the substrate;

15 and

wherein the substrate further comprises a plurality of electrically conductive traces disposed between the pairs of electrical lead pads such that the LEDs are electrically connected in series via a circuit electrically isolated from the heat dissipating structures.

20

10. The lighting assembly as recited in claim 9, wherein the heat dissipation region has at least twice the area of the LED thermal pad.

11. The lighting assembly as recited in claim 9, wherein the heat dissipation region includes first  
5 and second regions extending from opposite sides of the LED thermal pad.

12. The lighting assembly as recited in claim 9, wherein the heat dissipating structure includes an isolated region that is electrically isolated from the heat dissipation region, the isolated region having a plurality of heat conducting vias that extend through the circuit board and are thermally  
10 coupled with the thermally conductive region.

13. The lighting assembly as recited in claim 12, wherein the vias are arranged in spokes that extend outwardly from the LED thermal pad.

14. The lighting assembly as recited in claim 12, wherein the vias are within the heat dissipating structure, but electrically isolated from the heat dissipating structure by a non-electrically-conductive region.

15. The lighting assembly as recited in claim 12, wherein the vias and the heat dissipation region  
20 are thermally connected with a conductive bridge layer opposite the circuit board, the conductive bridge layer being electrically isolated from the vias and/or the heat dissipation region by a dielectric layer.